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5

6 **Abstract**

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8 We compare the scope of museum digitization in the Russian Federation, a country with diverse
9 cultural heritage and over 2,300 museums, with the scope of digitization in Europe as measured by
10 the Enumerate Survey of 355 museums from 20 European countries initiated by the Collections
11 Trust, UK, in 2011. Our paper shows that the reach and scope of digitization in Russia is lesser
12 than that of European museums. Digitization is mainly done in Russia for inventory purposes. The
13 share of digitized objects published online is comparable to that in Europe if we consider images
14 published on museum websites, however much content from Russia is not licensed as reusable,
15 partly due to the different legal framework that exists there. The paper challenges the perceptions
16 that global heritage collections are becoming more visible and accessible. It shows that future
17 digital analysis of cultural heritage may be only possible with corpora of images provided by
18 museums that publish numerous images from their digital collections online, while pursuing the
19 policies of free image reuse alongside open licensing. Such corpora may not be found beyond a
20 limited number of Western collections, which may result in excluding many cultures from
21 humanities research.

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Introduction

The rate and coverage of digitization throughout Europe and the Western world is monitored and understood (Navarette, 2014; Europeana, 2017; Minerva EC, 2017). The reach and scope of digitization across Russia, a huge country with diverse heritage, is almost unknown. In this paper, we build on previous work (Kizhner *et al* 2016a) by using Russian Ministry of Culture statistics to calculate the percentage of museum collections that have been digitized across Russia. We identify country-wide patterns showing that there are huge regional variations for the scope of digitization and quantity of digital images produced and that there are limited amounts of images posted online. Our analysis clearly demonstrates that despite numerous local efforts and state-wide programmes to build a national aggregator of museum images, there are few outcomes, and Russian cultural heritage is significantly absent online, compared to the average results for European museums. We suggest that studying non-European digitization practices can lead to further understanding of the digital canon upon which analysis of culture is based (Limb, 2007; Warwick *et al.* 2012; Price, 2009; Earhart, 2012), allowing us to question the biases and online-premium experienced by the cultures which are digitized and made available, either for online viewing, or further open licensing.

Analyzing the representation of heritage collections in the online medium is the first step to understanding how they contribute to international perceptions of culture in the digital age. We monitor various characteristics to be able to understand the complex status of digitization in Russia, including: the history of digitization in Russia, assessing the number of images available in museum databases and images available online; understanding the licenses and legal frameworks that govern any reuse; noting the importance of multi-lingual interfaces and metadata; and noting the differences between digitization in city centre and provincial collections. We discuss Russian digitization as an example of complex, bottom-up, unstructured data creation distinct from western approaches to content re-use, open data, linked data and repurposing (Robinson, 2013; Kizhner *et al.* 2016b). We show that incomplete understanding of digitization as technology and social force (Gooding *et al.* 2013) can lead to a lag in undertaking digitization at scale, and ask how a potential change in digitization practices, which would be inclusive of Russian culture and approaches, can broaden the digital canon available to international researchers.

This paper provides, for the first time, data on Russian digital cultural heritage collections, which are generated from museums scattered across a huge country with diverse collections representing European and national heritage. By using established methods from monitoring European collections, we highlight difficulties, opportunities, and ramifications for online cultural heritage, in a wider European context. We clearly demonstrate that future analysis of cultures for humanities research may be biased toward the corpora of digitized images published online and licensed for free reuse, which may have complex ramifications for the study of Russian cultural heritage, and beyond.

2. Digital Collections in Russian Museums

2.1 Historical Background

It is never easy to build a single narrative of museum computing (Parry, 2007). Conflicting forces of building inventories, providing access, managing idiosyncrasies of museum descriptions and introducing standards of machine-readable metadata mean that the field did not develop in a straightforward mode or a single direction (ibid). However, this paper will demonstrate that Russian museum computing has been more about building inventories than about developing digital collections that can be accessed as large scale digital image repositories, or built on to provide more advanced digital resources in the humanities, such as digital scholarly editions¹.

Although digitization has a long history in Russia covering the early days of museum computing in the country (Sher, 1978; Sher, 2006; Nol, 2007; Mikailova, 2013) and creating the first Russian collection management systems (Brakker, 2013; Brakker, 2017; KAMIS, 2017; Loshak, 2017), we do not have a consistent discussion of the current status of digitization of Russian cultural heritage within institutional settings.

From the 1970s, the rationale for museum digitization practices in Russia was quite similar to that in many other countries, being informed by a need for information and collection management so that museum objects would be catalogued and properly conserved (Aseev and Sher, 1983; Williams, 2010; Chenhall and Vance, 1987; Navarette, 2014). The synergy (or conflict) of keeping inventories and providing access continued in the late 1990s and early 2000s. An important initiative of providing access to Russian museum collections stems from 1997 when The State Hermitage Museum² and IBM³, a computational industry partner, launched an important collaboration programme. IBM provided a scanner - then a rare and expensive peripheral - and software, a web application, design, and user interface design for the museum web site (Fig. 1) which was launched in 1999 (IBM, 2017). The State Hermitage Museum was unique in developing its digitization programme and publishing collections on its web site as the museum combined the advantages of having dedicated curators to provide metadata, ability to use high-quality digitization technology provided by a commercial company, and IBM technology to develop its web site. The interaction of this major museum with large commercial companies was quite typical for a rise of digitization observed in many countries in the 1990s when museums benefited from large-scale applications of technologies and companies could experiment and build their reputation on the achievements (Terras, 2011).

The balance between keeping inventory databases and providing access to collections resulted in building the National Catalogue of the Russian Federation (RF) Museum Collections. Russian government policy related to the need of preserving collections from 1996 onwards (Federal Law number 54-FZ) was aimed at building the resource (Fig. 2), first as an offline catalogue for inventory purposes,

111 later as a comprehensive open database posted online⁴ (Ministry of Culture of the
112 Russian Federation, 2017b).

113 The catalogue is supposed to be completed by 2026 when metadata and images
114 for all objects from the RF Museum Collections will be included in the registry and
115 posted online (Ministry of Culture, 2017b). Uploading the data is mandatory for all
116 public museums and the planning/timeline is supposed to be controlled by the
117 Ministry of Culture at the federal level for the most important museums (Ministry of
118 Culture, 2017c), and at the regional level for regional and local museums. The
119 National Catalogue includes three registries. The offline registry of Russian public
120 and corporate museums is maintained as a mandatory list, and private museums can
121 be included on a voluntary basis. The second registry is an offline registry of museum
122 objects for managing acquisition and accession, controlling location and movement.
123 The third registry is the online database mentioned above (Fig. 2). It was developed
124 for research in the humanities and for the general public. The guidelines available on
125 the web site of the National Catalogue inform museum professionals that the
126 mandatory data to upload are an image, title (or object type), period, dimensions,
127 accession numbers, classification field from a guideline, property type for a museum
128 object (e.g. federal property), and credit line. This means that the collection
129 management system will not allow the uploading of records without images (Ministry
130 of Culture, 2017a). It is not yet a comprehensive database as it only includes images
131 for 5% of museum objects in the RF Museum Collections so far. This indicates that,
132 in order to meet legislative requirements from the RF Ministry of Culture, a mass
133 program of digitization will need to happen across Russia. Consolidated museum
134 activities may result in providing images and metadata to be published in the
135 National Catalogue for the total number of museum objects by 2026 but the quality of
136 images and metadata may suffer (Pravdina and Loshak, 2017).

137 Beyond the RF catalogue, we analyzed the representation of Russian digital
138 collections through international aggregators of content, but there were not vast
139 amounts of Russian content available via these mechanisms, given the overall
140 number of objects contained in these content management systems⁵. In 2008-2009,
141 five Russian museums⁶ expressed their interest in contributing metadata of objects
142 from their online collections to Europeana (Brakker, 2009). Between 2009 and 2011,
143 these museums submitted metadata for 43,839 objects (Brakker and Kuibyshev,
144 2013). Metadata for more objects were added between 2011 and 2015 and their
145 number is 48,689 at the time of writing this paper (Europeana Collections, 2017).
146 Google Arts and Culture⁷ provides access to the images and metadata for 14,000
147 museum objects from Russian collections.

148 During the course of the digitization of Russian museum collections, we have
149 observed dedicated work aimed at providing metadata standards and descriptions
150 (early years of museum informatics at the State Hermitage Museum, developing first
151 Russian collection management systems, contributing metadata to Europeana
152 Collections). We have seen exciting efforts of providing access to Russian cultural
153 heritage at the very beginning of cultural heritage digitization (The State Hermitage
154 Museum web site). Further research is needed to understand various drivers of
155 digitization in the Russian history, considering that, despite obvious advances, we

observe a low involvement in providing access at national (National Catalogue of the RF Museum Collections) and international (Europeana Collections) levels. The following sections will demonstrate that access to images and metadata from separate museum web sites is low at the moment of writing this paper. This means that Russian cultural heritage does not have a significant potential to be used for enjoyment, education and research before 2026 when museum efforts are supposed to be consolidated to provide access to a major part of collections through the National Catalogue of the RF Museum Collections (Ministry of Culture, 2017b). This is important when we consider how the humanities develop and what collections inform scholarly results/international perceptions.

3. Assessing the Spread of Digitization across Russian museums

3.1 Methodology

The National Catalogue of the RF Museum Collections (Ministry of Culture of the Russian Federation, 2017a) is an initial access point in finding out the scale of museum digitization in various parts of the country including its remote regions. Our previous paper (Kizhner *et al.*, 2016a) demonstrated preliminary results of a survey estimating the percentage of digital images for Russian museum collections. The study also included web site exploration results on the percentage of museum collections posted online. However, we only asked 1.2% museums in the country for the percentage of digitized images, and explored 6% of museums for the images posted online. The results gave initial estimates, indicating that the uptake of digitization for Russia is lower than that in Europe - 18% of analogue collections compared to 31% for European museums (Nauta and van den Heuvel, 2015, p. 20), and that the percentage of images published online is low (1.5%) but comparable to that published in Europe (7%) (ibid.). We studied the scope of digitization across a diverse country with huge cultural and ethnic heritage. The limitation of our study was that as well as being based on a small sample, we did not look at the quality of collections, importance of museum objects for humanities research or the quality of digitized images.

The present paper studies the uptake of digitization in Russian museums through the statistical reports (Form 8 nk) submitted to the Ministry of Culture from 2,367 museums in 2015⁸. The annual statistical reports are mandatory for all museums reporting to local municipalities, regional administrations and the RF Ministry of Culture, in fact for all non-private and non-corporate museums. From these, we can generate the average results for the country and the average results for its eight major geographical regions. This will show the distribution of digitization activities and content across Russia. We aim to contrast the data available with that from the Enumerate project, which is a study of the uptake of digitization across Europe between 2011 and 2015, funded by the European Union (Europeana, 2017), which will allow us to ascertain whether Russian digitization efforts are equivalent to those being undertaken elsewhere. We used the data from the Enumerate Survey of 2015

(Nauta and van den Heuvel, 2015) including 355 museums from 20 European countries.

We obtained the data of the RF museums' statistical reports for 2015 from the RF Ministry of Culture in summer 2016, after an enquiry submitted via email by the Office of Provost, Siberian Federal University, to the RF Ministry of Culture. The complete data received as an aggregated spreadsheet for the filled 8 nk Form (RF Ministry of Culture Statistics, 2017) relates to 2,635 museums from every region of the Russian Federation⁹. To the best of our knowledge, this data has not been previously used to study the scope of digitization, either at a regional or at a national level.

The data was received as an Excel spreadsheet. We redacted the spreadsheet removing information which did not relate to the digitization of museum objects, or contained data on galleries that were for temporary display: this data cleaning resulted in 2,367 museums. The data in the spreadsheet was analyzed to give the total number of objects for every museum, the number of database records with digital images, the number of images posted online, and the availability of English interfaces counted manually at a later stage (the data on English interfaces was not included in the spreadsheet). The table received included data for over 2,000 museums and it was too large to be added to this paper as an appendix so we chose to present the results of the analysis.

4. Results

The percentage of digital images as related to the total number of museum objects across Russia was 14%. This is a low uptake compared to the average numbers for Europe as The Survey Report on Digitization in Europe for 2015 shows 31% digital images as compared to analogue objects in museum collections (Nauta and van den Heuvel, 2015). The scope of digitization varied across geographical regions (Fig. 3, Table 1) declining relatively steeply in the Far East (the lowest scope), Volga Federal District and Caucasus. The greatest level of museum digitization that exceeded the European level was observed in Saint Petersburg. The scale of digitization across major geographical regions varied between the minimum of 6% in the Far East and the maximum of 25% in the regions adjacent to Saint Petersburg (Fig. 3, Table 1). This means that online scholarly access and promoting cultural heritage of Russian provinces is going to be more difficult even when (if) images are available online via the National Catalogue (the museum objects necessary to study the cultural heritage of the country have not been digitized).

The Survey Report on Digitization in Europe (ibid.) demonstrates the perceptions of museum staff regarding the necessity to digitize museum objects. Curators think that 86% of museum collections have to be digitized. This means that historical and cultural information has been digitally reproduced for a third of European museum collections, for the same number of collections in Saint Petersburg and for a much smaller number of collections in Siberia, the Russian Far East, and Volga District where ethnographic and historical museum repositories obviously represent a great interest.

An interesting and unexpected result was the difference between the scale of digitization in two major cities, Moscow and Saint Petersburg. The percentage of analogue objects with digital images was much higher in Saint Petersburg than the average across Russia and much higher than that in Moscow. A possible explanation of the IBM/Hermitage project started in 1997 (see above) triggering digitization activity in the museum community in Saint Petersburg may be a partial explanation. In addition, a strong uptake of digitization in this region relates to the interaction of the museum community in Saint Petersburg and the Russian Academy of Sciences in the 1970s, followed by collaboration with national and international commercial companies, including IBM, at a major scale, followed by *KAMIS: Museum Collections* (see above) working in the region.

Places	The percentage of the analogue collections digitally reproduced as related to the total number of objects, %	The percentage of digital images posted online as related to the total number of analogue objects, %
The average across Russia	14	1.44
Saint Petersburg	36	0.93
North-West (North-Western Federal District)	25	1.32
Ural Federal District	18	3.2
Southern Federal District	16	1.3
Centre (Central Federal District)	11	1.77
Siberian Federal District	11	0.79
Moscow	10	1.28
Caucasus (North-Caucasian Federal District)	9	1.16
Volga Federal District	8	1.18
Far Eastern Federal District	6	0.93

Table 1 The percentage of the analogue collections digitally reproduced and available online in the museums of Saint Petersburg, Moscow, and across Russia.

We can see that digital collections do exist across the country, but their scope varies and the level of digitization beyond the North-Western Federal District is much lower compared to the average European level of digitization.

It is especially important to understand a combination of digitally reproduced images and the scope of images posted online (Fig. 4, Table 1). For example, Saint Petersburg with the record level of digitization at 36% makes only 0.93% of the city's analogue collections published online and visible (Fig. 4, Table 1). The Ural Federal District with the level of digitization at 18%, the second highest in the

country, provides digital access to 3.2% of its analogue collections. Cultural heritage in this part of the country is the most accessible to online users, while museum collections in Siberian Federal District are least accessible (Fig. 4, Table 1) The effect of invisibility of Siberian museum collections may result in an inadequate impression regarding Siberian cultural heritage. A question ‘Do Siberian museums exist as data for the humanities researchers?’ may indeed be asked in this context.

We can see that digital collections of Russian museums mostly exist for inventory purposes. Visibility of Russian digital collections, consequent access to images for scholarly studies and introduction of Russian cultural heritage to the international cultural discourse depends on the combination of digitally reproduced images and images published online. With numerous international cultural collections available online, a major part of Russia’s cultural heritage may be at risk of staying inaccessible for public use and scholarly analysis at national and international levels.

We analyzed whether the information on Russian digital collections is provided in English¹⁰. We compare Moscow, Saint Petersburg and adjacent regions with provinces demonstrating that digital collections for museums in Siberia, Far East and the Caucasus are least accessible to international online users. As shown in Table 2, museums in Moscow, Saint Petersburg and adjacent regions in North-Western Federal District indeed provide English interfaces. Almost a half of museums in Moscow provide English interfaces but only a half of them (sixteen museums out of twenty-eight) provide several images of museum objects linked to an English interface. Fifteen museums across Russia (0.63% of the total museum number) provide metadata in English. In Moscow, metadata in English is present on the web sites of The Pushkin State Museum of Fine Arts¹¹, The State Tretyakov Gallery¹², The Polytechnic Museum¹³, and Moscow Kremlin Museums¹⁴. A similar situation of attracting physical visitors and obvious difficulties in accessing online collections is characteristic of museums in Saint Petersburg. While twenty-five museums in Saint Petersburg provide English interfaces only three major museums (The Hermitage Museum, Museum of the History of Saint Petersburg, and The State Russian Museum) present metadata in English so that they can be retrieved as separate museum objects by non-Russian speaking users.

Place	Number of museums in the data set	Absolute number of museums with English interfaces/metadata in English	English interfaces (% as related to the total number of museums)	Metadata in English ((% as related to the total number of museums)
Saint Petersburg	39	25/3	64.10	7.69
North-West (North-Western Federal District)	161	29/2	23.18	1.25
Ural Federal District	186	9/1	4.69	0.52
Southern Federal District	151	4/1	2.65	0.66
Centre (Central Federal District)	400	21/1	9.64	0.25

Siberian Federal District	359	5/0	1.39	0
Moscow	64	28/5	43.75	7.81
Caucasus (North-Caucasian Federal District)	122	1/0	0.82	0
Volga Federal District	448	13/2	2.42	0.44
Far Eastern Federal District	155	2/0	1.15	0
Total across Russia	2,367	137/15		
The average across Russia			5.78	0.63

Table 2 Accessibility of online museum collections to international users. Geographical distribution of museums where web sites include an English interface and metadata in English as related to the total number of museums in a region.

Russian museums understand digitization of their collections as the necessary tool of maintaining museum registries for inventory purposes. This is demonstrated by a dramatic difference between the percentage of digitally reproduced images and images posted online, especially in an advanced region of Saint Petersburg and the North-Western Federal District.

5. Closed Collections

‘Permissions culture’ (Bielstein, 2006; Whalen, 2009; Petri, 2014; Aufderheide et al 2015) is a situation when the society expects users to ask for permissions or licenses when interacting with visual art in a digital environment. The degree of freedom for this interaction varies in different countries (see, for example, Aufderheide et al. 2016 discussing the limitations of ‘fair use’ implementation in the USA and Wallace and Deazley 2017 for real life examples from museums in a number of countries). In Russia, the ‘permissions culture’ is maintained by the legislation of the Russian Federation¹⁵. This means that museums are supported by federal or local Ministries of Culture and they can claim their rights of being asked for permissions. The State Hermitage Museum allows image reuse for student projects, educational handouts, doctoral theses, presenting research results at conferences. Publishing your conference slides online will involve asking the museum for permission as if it were a research publication or a commercial product for which a permission or license are required (The State Hermitage Museum, 2017). Previously we demonstrated that moving images across platforms and outputs for different research projects, for example to develop scholarship or digital resources in the humanities, may not be possible in Russia as a permission from a museum tends to relate to a single project and changing its use will require a new license (Kizhner *et al.* 2016b).

Russian museums are not an exception in keeping their collections ‘closed’. A recent study demonstrates that about 80% of museums in a sample of 175 institutions in English speaking countries (USA, UK, Canada, Australia, New Zealand) allow image re(use) only on the condition of requesting permissions (Esalieva, 2017). A

337 study of museum reputation (Van Riel and Heijndijk, 2017) features 18 famous art
 338 museums and relates their rankings to the awareness of their existence. When we
 339 manually checked the museum web sites for the documents on image policies, we
 340 found that two-thirds of the museums do not pursue an open access policy (Table 3).
 341

Policy type	Museums
Open access (commercial reuse allowed) for images in the public domain	Metropolitan Museum of Art, National Gallery of Art, Rijksmuseum
Non-commercial reuse allowed for images in the public domain or where copyright is cleared by a museum	The Louvre, British Museum, Van Gogh Museum
Personal and educational use, otherwise permitted use only (a fee may apply)	State Hermitage Museum, Musée d'Orsay, Museo del Prado
Permitted use upon request (a fee may apply)	National Gallery, Vatican Museums, Tate Modern, Musée National d'Art Moderne, Reina Sofia, Museum of Modern Art
Requests to provide images (no fee is applied)	National Art Centre, Japan
No information on policy type	Centro Cultural Banco do Brasil, Shanghai Museum

342
 343 Table 3 A list of eighteen famous museums from a recent study of what influences museum
 344 reputation (Van Riel and Heijndijk, 2017) and their re-use policy types. Two-thirds of museums in
 345 the study do not pursue open access policy.
 346

347 This shows that Russian museums are not the only institutions which prevent
 348 their images from being circulated for humanities research, or contribution to a new
 349 online visual canon (Price, 2009). However, the complex legal framework within the
 350 Russian context effectively precludes involvement in the ‘Open GLAM’ movement¹⁶,
 351 where individual institutions within other legal cultural contexts may have a choice
 352 whether or not to engage and prioritize open licensing and online access to digitized
 353 content.
 354

355 **6. Limitations**
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357 Russian museum collections tend to consist of two parts: the main collection of
 358 objects and a smaller ‘research collection’ including analogue copies of objects,
 359 supporting documentation, museum library books, plans, and maps (Ministry of
 360 Culture, 1985). While the total number of objects in Russian museum collections

361 slightly exceeds 80 million objects, the number of original objects (including
362 duplicates) is actually 60 million objects. The aggregated results of the statistical
363 surveys (RF Ministry of Culture Statistics, 2017) obtained for the study reported the
364 number of digitized objects as related to the total number of objects in a museum
365 including their ‘research collections’. This did not create a methodological problem
366 when comparing the results with those from the Enumerate project where the Survey
367 Report on Digitization provided the percentage of digital images for museums’
368 analogue collections (Nauta and van den Heuvel, 2015, p. 20), but the research
369 collection aspect should be borne in mind when looking at the statistics provided
370 here. We cannot tell which objects were digitized in a given museum, and whether
371 museums preferred to include or exclude the ‘research collection’ from the reported
372 dataset. If they did exclude the research collection (which is logically justified), the
373 scope of digitization would be higher, if they did not (which is quite feasible because
374 they may have preferred to report all objects with images), the scope of digitization is
375 equal to that reported in the results section (for the data on the percentage of digitized
376 objects and objects published online as related to the number of original objects see
377 Table 4).
378

Places	% analogue museum objects with digital images for the main collection (without library books and supporting documentation)	% for the digitized objects published online (without library books and supporting documentation)
The average across Russia	18	2,15
Saint Petersburg	44	1,10
Moscow	12	1,50
Centre (Central Federal District)	14	2,25
North-West (North-Western Federal District)	33	1,78
Southern Federal District	23	1,84
Caucasus (North-Caucasian Federal District)	12	1,50
Volga Federal District	11	1,65
Ural Federal District	25	4,60
Siberian Federal District	16	1,12
Far Eastern Federal District	8	3,16

Table 4 The percentage of the analogue collections digitally reproduced and available online in the museums of Saint Petersburg, Moscow, and across Russia (for collections without supporting documentation and museum library books).

Another limitation of this study is that we do not consider what digitized content has been ‘cherry-picked’ for online presentation (Besser, 1997), what influences the decision making of what is being digitized or posted online and what impact it has on culture perception. We do not consider the quality of images published online, either, leaving aside the question of how low (high) quality - whether high resolution, or effective color management procedures, for example - influences image perception and contributes to maintaining a balance between keeping images under control and providing access that matches users’ expectations given the current online environment.

7. Discussion

Our findings demonstrate that digital collections in Russian museums do exist across the country, in both metadata and digitized content, but we cannot say that their online display is representative enough to cover the culture considering the variety in

geography and ethnography. We can roughly confirm our previous results on the percentage of museum objects with corresponding digitized images across the country (Kizhner et al., 2016a) to be in the region of 18% as our present data show the level of digitization is on average 14% in each museum. However, our previous results might have a sampling bias as the museums answering the questions of the survey could be interested in digitization per se and work towards obtaining more financial and administrative support to sustain this activity.

Comparing our data with those from the Enumerate project ‘which aimed to survey the extent of digitization across Europe’ (Europeana, 2017) where some survey questions were about the percentage of the analogue collection digitally reproduced (Nauta and van den Heuvel, 2015, p. 20), we can say that the average results of the present study at 14% are much lower than the results of the Enumerate project for 2015 when the percentage of digitized collections in European museums was 31%. The Enumerate project allows comparing data across museums, libraries and archives and its Survey Report demonstrates a higher percentage of analogue objects with digital reproductions for museums compared to libraries at 19% and archives at 13% (ibid.). We cannot make a similar comparison across sectors to get a full understanding of digitization activities for Russian cultural heritage due to the lack of data on Russian digital collections in libraries and archives. The results for Saint Petersburg museum collections are higher than the European average (Fig. 3, Table 1). The percentage of images available online across Russia as related to the analogue collection is 1.5% which is lower than the percentage reported by the Enumerate project (24% of digital collections and 7.5% of European analogue collections). However, the Enumerate results included digital collections and digitally born objects available online, which complicates the comparison (Europeana, 2017). A clear dominance of digital collections in the North-Western part of the country may be partially explained by the existence of a skilled labour pool in this region, the historical links to technical companies, infrastructure, and western influences. Historical reasons of the influence of museum professionals from Saint Petersburg, the centre of the North-Western District, including their links to major international and national companies, such as IBM and *KAMIS: Museum Systems*, are also important.

It would be indeed tempting to position the North-Western Federal District as an island of digitization efforts. What is strikingly incompatible with this argument is the ratio of images of museum objects posted online. The figure is 1.32% for the North-Western Federal District and even lower (0.93%) for Saint Petersburg, almost twice as low as the average across Russia at 1.44%. The figure is equal to the percentage of images posted online in the Far East (Fig. 4, Table 1). While objects are being digitized, those images are not being posted online, in an overturning of the open data principles that we are seeing being uptaken across Europe and America (Borgman, 2015; Boyle, 2010; European Commission, 2016; Terras, 2015). A possible explanation could be that major museums in Moscow and Saint Petersburg have huge collections with millions of objects. Another explanation might be an argument of attracting visitors to physical museums. This is quite consistent with a high number of web sites with English interfaces - museum administrators might

want an English interface to attract the international public to a physical museum¹⁷. The web sites with metadata in English are available for some of the most important museums with famous collections featured in printed international sources (The State Tretyakov Gallery, The State Russian Museum, Moscow Kremlin Museums), European paintings from the Hermitage Museum and the State Museum of Fine Arts in Moscow.

Starting from the 1980s, influencing content selection for what can be digitized and included in a database was an issue that significantly affected this early work. The Hermitage Museum's senior management was much interested in building a collection management system for the museum's collection of European paintings (Sher, 2006). Their intention to transfer famous works from printed materials to digital collections can be easily explained and understood in terms of promoting the State Hermitage Museum as an institution that keeps and maintains European core values. Another possible explanation of keeping online museum images within a printed canon may be the feeling of control, a concept discussed in the context of licensing images by American museums in the early twenty first century (Kelly, 2013). The feeling may be quite common all over the world and Russian museums may not be an exception. Challenging 'permissions culture' in visual art (Bielstein, 2006) and relying on public domain images to be published without restrictions (Petri, 2014) as it happens in several museums across the world (Aufderheide *et al.*, 2016) has been complicated by a strong opposition of museum gatekeepers when museums assume that 'permissions are inevitably required' (Aufderheide *et al.*, 2016, p. 3). Russian museums are supported in these assumptions by the RF legislation¹⁸ (Kizhner *et al.*, 2016b).

The National Catalogue of the RF Museum Collections is supposed to include records with images from all museum collections in the Russian Federation except private museums by 2026 (Ministry of Culture, 2017b). We can only hope that the Catalogue can meet its planned target figures within a reasonable period. If it does so and if Russian digital policies change to allow openly licensed content and content repurposing, then Russian cultural heritage will be accessible to a wider national and international user base. If it does not, then Russian cultural heritage will not have adequate representation in online cultural heritage resources, and this could lead to insufficient knowledge about the country's cultural heritage on a global scale in an age when countries compete for better visibility through digital media.

8. Conclusion

Our novel contribution is in comparing the scope of museum digitization in Russia with the scale of digitization in Europe (using Nauta and van den Heuvel, 2015 as an example). Our findings clearly demonstrate that the scope of digitization is lower than in Europe: the number of images posted online does not contribute to building a clear picture of Russian cultural heritage and the information on Russian museum collections is not accessible to the international audience as very few museums publish metadata in English or have English interfaces beyond a few famous museums. This is the case despite important historical developments and significant

initiatives in museum computing scattered across the country. Our results challenge the perception of museum collections across the world as ‘visible and easily accessible’ (Salamon-Cindori et al., 2014). Increased access at a European level prevented only by technical or copyright issues (Taylor and Gibson, 2016) does not mean it has been achieved worldwide. Although much is known about a group of museums with a large share of their collections published online (Aufderheide et al., 2016) or European museums that have digital collections (Nauta and van den Heuvel, 2015), further research is needed to find out the share of museums at an international scale that are indeed able to contribute to disseminating the information on cultural heritage through their digital platforms.

If non-Western collections will continue to stay invisible and inaccessible, building an art historical corpus (Drucker, 2013) and applying ‘data science’ to visual analysis in art history (Manovich, 2015) will be restricted to Western museum data. Further steps of data simulation, dimension reduction and extracting new, unexpected dimensions from large sets of visual data (Manovich, 2016) will be limited by accessible data sets and the analysis will be, obviously, biased towards the represented heritage characteristics of the Western culture.

The sheer magnitude of digitization efforts in creating open archives, a road taken in Europe and elsewhere, demands intertwining digitization efforts and research on artistic canon evolution in a digital era. Eventually, the cultural biases of the twentieth century that are rooted in the colonial and political attitude of the nineteenth century (Said, 1993) will be substituted by the attitudes of the generations from the twenty first century. Harnessing the culture of remix (Lessig, 2008), introducing careful attitudes to what is used and re-used to build a new perception of culture suggests that further research is needed on how a future digital canon is created or how it may differ from printed publications. Who decides what is being digitized, posted online, easily retrieved, linked to further knowledge is an important research question to arm further studies (and, indeed, it would be useful to carry out equivalent studies comparing the results of the Enumerate study to museum digitization activity in other geographical areas, to be able to assess the predicted dominance of European and North American digital culture online).

This paper presents the first view on the state of Russian digital collections on a national scale and regional scales, reporting on the scale of digitization for major geographical regions within Russia. By doing so we can challenge the concept of the digital canon, and claim that the printed canon should be essentially extended within the digital space. Our research supports recent criticism of digitization that is not accompanied by thematic context that is strong enough to generate added knowledge in the humanities (Hitchcock, 2013, Gregory *et al.*, 2016). In the Russian context the delay of digitization and online publishing may be exploited to build a network of historically meaningful context that gradually introduces masterpieces and artworks from a variety of regional/social contexts and links them together. National programs are needed to introduce recommendations on how Russian museum web sites and/or the National Catalogue of the RF Museum Collections should host images for searching and browsing to provide infrastructure that can assist humanities research, and what the ramifications of not meeting the deadlines for providing a Russian-wide

catalogue of museum objects will be, given no mass digitization program exists, or is resourced, there. Future research may be also needed to find out the scope and reach of digitization in the library and archive sector in the Russian Federation to further understand how the national cultural heritage may be accessed by a wider audience. The task of building inventory databases to get rid of the burden of clerical chores may be just an initial step towards reaching significant economic, social and cultural impact (Drucker, 1967, Gooding *et al.*, 2013). Only by extending the scope and reach of digitization of cultural and heritage collections in Russia, can they become accessible to both national and international audiences.

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552 **Notes**

553

554 1. A complicated task that has been rarely achieved for textual materials and requires
555 sophisticated training in editing skills and knowledge of the history of book
556 (McGann, 2013). A recent study shows that there are only about 300 digital
557 scholarly editions worldwide (Franzini et al. 2015).

558 2. <https://www.hermitagemuseum.org/wps/portal/hermitage/>

559 3. <https://www.ibm.com/us-en/>

560 4. At the time of writing, the catalogue is available in Russian at

561 <http://goskatalog.ru/portal/#/>

562 5. At the time of writing there are fifty one million objects in Europeana Collections
563 (Europeana Collections, 2017).

564 6. The State Tretyakov Gallery <https://www.tretyakovgallery.ru/en/>, Saratov State
565 Museum of Fine Art <http://artkatalog.radmuseumart.ru/en/>, Rybinsk Museum (near
566 Yaroslavl) <http://www.rybmuseum.ru/en/>, Chuvash State Museum of Fine Art
567 <http://www.artmuseum.ru/museumexpo/>, Kazan University Museum
568 [http://kpfu.ru/eng/about-the-university/museums-and-library/the-museum-of-](http://kpfu.ru/eng/about-the-university/museums-and-library/the-museum-of-history-of-kazan-university/exhibition-halls)
569 [history-of-kazan-university/exhibition-halls](http://kpfu.ru/eng/about-the-university/museums-and-library/the-museum-of-history-of-kazan-university/exhibition-halls). It should be noted that four museums
570 on the list provide interfaces in the English language, and are obviously interested
571 in visibility/access to their collections at an international level.

572 7. <https://www.google.com/culturalinstitute/beta/?hl=ru> Google Arts and Culture is a
573 digital collection of museum objects initiated by Google and launched in 2011 as
574 an online platform to provide access to high-resolution images of artworks.

575 8. The RF Ministry of Culture introduced national statistics related to museums
576 (Form 8 nk) in 2003. Form 8 nk for 2017-2018 is available on the web site of the
577 RF Ministry of Culture Statistics (RF Ministry of Culture Statistics, 2017).

578 9. The form includes 36 fields, the data is annually submitted to the RF Ministry of
579 Culture. The fields cover the information on the type of museum (public or
580 private), the type of museum object property (federal, regional or municipal), the
581 number of objects exhibited in the museum space, the number of objects that can
582 be physically accessed by the blind and visually impaired, the number of museum
583 objects requiring conservation, the number of objects cleaned, repaired and
584 stabilized in the reported year, the number of museums with electronic inventories,
585 the number of museums with the Internet access, etc.

586 10. English has been long considered a global language (Crystal, 1997) or ‘today’s
587 dominant language of science’ (Ammon, 2001, p.v). There is some evidence
588 supporting the claim that search engines favor pages in English giving them a
589 priority in rankings (Al-Eroud et al, 2011).

590 11. <http://www.arts-museum.ru/?lang=en>

591 12. <https://www.tretyakovgallery.ru/en/>

592 13. <https://polymus.ru/eng/>

593 14. <http://www.kreml.ru/en-Us/museums-moscow-kremlin/>

594 15. Federal Law number 54-F3, 26 May 1996 on Museums and Museum Collections
595 in the RF, amended in 1996, 2003, 2004, 2008, 2010, 2011, 2014, 2016. Article No
596 36 states that copying museum products is impossible without a written permission
597 from museum administration. The second law regulating, in particular, image reuse

is ‘Basic Legislation of the Russian Federation on Culture’ number 3612-1, 9 October 1992, amended in 2017. Article No 53 states that companies and public institutions can use the images of cultural heritage objects only with the permission of an object owner. Because the owner is either the Russian Federation or a region within the Russian Federation in the case of public museums, the owners’ rights are looked after by either federal or regional Ministries of Culture (Federal Law number 54-F3, 26 May 1996, Article No 4).

16. <https://openglam.org>

17. Of course, major British and USA galleries, libraries, archives and museums do not provide interfaces in languages other than English. See, for example, the website of the Metropolitan Museum <https://www.metmuseum.org> or Tate Britain <http://www.tate.org.uk/visit/tate-britain>

18. Federal Law number 54-F3, 26 May 1996 on Museums and Museum Collections in the RF, amended in 1996, 2003, 2004, 2008, 2010, 2011, 2014, 2016.

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857

858 **List of Figures with Legends**

859

860 **Fig. 1**

861

862 The interface developed in 1999 included the options of viewing collection highlights
863 and browsing the State Hermitage Museum’s digital collection. The museum web site
864 with a new interface was launched in 2014. Courtesy of State Hermitage Museum.

865

866 **Fig. 2**

867

868 At the time of writing, the National Catalogue of the RF Museum Collections
869 includes images and metadata for 4,129,149 objects, 5% of Russian analogue
870 museum collections.

871

872 **Fig. 3**

873

874 The percentage of images in the digital collections (databases) of Russian museums
875 as related to the number of analogue objects in a museum (the average value across
876 Russia is 14%). This clearly shows a difference between the advanced regions in the
877 North-West, with the scope of digitization almost reaching the European level of
878 31%, and the rest of the country.

879

880 **Fig. 4**

881

882 The percentage of digital images posted online as related to the total number of
883 analogue objects. The lowest percentage is observed in Siberia, Far East and Saint
884 Petersburg. Images of analogue museum objects are underrepresented online even in
885 the case they have been digitized. This shows that digitization is mainly conducted
886 for inventory purposes.

887

888 **List of Tables s with Legends**

889
890 **Table 1**

891
892 The percentage of the analogue collections digitally reproduced and available online
893 in the museums of Saint Petersburg, Moscow, and across Russia.

894
895 **Table 2**

896
897 Accessibility of online museum collections to international users. Geographical
898 distribution of museums where web sites include an English interface and metadata in
899 English as related to the total number of museums in a region.

900
901 **Table 3**

902
903 A list of eighteen famous museums from a recent study of what influences museum
904 reputation (Van Riel and Heijndijk, 2017) and their re-use policy types. Two-thirds of
905 museums in the study do not pursue open access policy.

906
907 **Table 4**

908 The percentage of the analogue collections digitally reproduced and available online
909 in the museums of Saint Petersburg, Moscow, and across Russia (for collections
910 without supporting documentation and museum library books).

911